L17: Entry 14 of 25   File: PGPB   Sep 13, 2001

DOCUMENT-IDENTIFIER: US 20010021260 A1
TITLE: MPEG2 moving picture encoding/decoding system

Summary of Invention Paragraph (54):
[0052] According to a first aspect of the present invention to achieve the second
object, an MPEG2 moving picture encoder includes a frame memory, a frame/field
memory, an activity calculator, a rate controller, a Discrete Cosine Transform (DCT)
unit, a quantizer, a dequantizer, an Inverse Discrete Cosine Transform (IDCT) unit,
an adaptation predictor, a motion predictor, a variable length Coding & Multiplexer
VLC & MUX and a buffer, and further includes a digital watermark inserter to
generate and discrete-cosine-transform a digital watermark on a frequency domain and
is installed between the DCT and the VLC & MUX; and a digital watermark remover to
remove digital watermark information on a spatial domain of the DCT embedded for
preventing an error while estimating motion on a temporal domain for P and B
pictures by being installed between the dequantizer and the IDCT.

CLAIMS:

4. The MPEG2 moving picture encoder as set forth in claim 2, wherein said digital
watermark inserter uses an 8.times.8 DCT to embed the watermark information on the
frequency domain of the video signal.

20. The MPEG2 moving picture encoding/decoding system as set forth in claim 19,
wherein said copy protection means comprises: a Discrete Cosine Transformation (DCT)
unit to discrete cosine transform the video input signal; a digital watermark
inserter to embed the watermark discrete-cosine-transformed by said DCT unit on a
frequency domain of the discrete cosine transformed video input signal; and a
digital watermark remover to remove the digital watermark on a spatial domain of the
discrete cosine transformed video input signal, for preventing an error while
predicting motion for a P and a B picture on a temporal domain of the discrete
cosine transformed video input signal.

23. The MPEG2 moving picture encoding/deciding system as set forth in claim 21
wherein said digital watermark inserter uses 8.times.8 DCT to insert said watermark
on the frequency domain.

WEST

☐ [Generate Collection] [Print]

DOCUMENT-IDENTIFIER: US 20020027612 A1
TITLE: Spatio-temporal channel for images

Abstract Paragraph (1):
A channel is inserted into a sequence of frames for an image, by varying one or more
display characteristics of the resulting image across the display in accordance with
a spatio-temporal pattern applied to, for example, successive lines of each modified
frame. In some cases, a reverse of the pattern is applied to a successive frame, and
the frames modified are preferably B-frames if the image may be encoded in
accordance with an MPEG standard. The channel may be employed to watermark the
image, and the watermark may correspond to the presence of the channel or may be
data in accordance with watermark information carried within the channel. For most
display devices, display variations are minimized during the design process, but
human viewers may still tolerate and accept subtle variations in a displayed image.
Slightly changing one or more display characteristics in accordance with watermark
information allows for watermarking of the image since viewers may not be aware that
display characteristics are changing. For example, the blue color component of the
video signal may be modified in accordance with watermark information defined as
$W(x)$ and its complement $[1-W(z)]$ in counter-phase rotations of successive lines in
pairs of frames. The blue color component of the video signal may be modified in
those regions of the image declared to be relatively still and with sufficient level
of blue-lightness. If the video signal is not encoded, the watermark information may
alter each pre-selected pixel value's least significant bit. If the video signal is
encoded, such as into the frequency domain as specified in the MPEG standard, the
corresponding (2,2) DCT coefficient in pairs of B-frames may be modified in
accordance with watermark information. The watermark information is applied in
relatively still portions of the image with sufficient blue-lightness level. A
receiver includes a watermark detector that has a priori information about the
watermark. The watermark detector examines specific regions of the displayed image
over time, and tests the regions for the watermark during time intervals when the
image remains relatively still. The receiver calculates the difference in pixel
values in still regions between the received test frame and either a) corresponding
pixel values in the non-modified image frame or b) the corresponding pixel values in
the successive frame of a pair.